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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/922,459	08/03/2001	G. Herbert Lin	3123-373	1375

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EXAMINER	
RODRIGUEZ, GLENDA P	
ART UNIT	**PAPER NUMBER**
2651	6

DATE MAILED: 03/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/922,459	LIN ET AL.	
	Examiner	Art Unit	
	Glenda P. Rodriguez	2651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-53 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-4,6-11,14,16-21,24,26,28,30-43 and 47-52 is/are rejected.

7)☒ Claim(s) 5,12,13,22,25-27,29,44-46 and 53 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 1, 2, 4, 6-11, 14, 16-21, 24, 26, 28, 30, 31-40, 43 and 47-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alex (US Patent No. 6, 429, 984).

Regarding Claims 1, 11, 21 and 30, Sacks et al: teach a method for providing an early warning of thermal decay, comprising:

Writing a test pattern to a magnetic disk (Col. 2, Lines 42-43 and Col. 6, Line 1-7 and Col. 10, Lines 3-10. Alex teaches data tracks being written in the medium and being analyzed by a test circuit, therefore, the tracks being used are tested and considered a test track with a particular test pattern being analyzed by the circuit.);

Measuring an amplitude of a signal produced by reading said test pattern (Col. 2, 43-44. Alex teaches that it measures the amplitude of the readback signal.);

Storing said measured amplitude (Col. 2, Lines 45-47. Alex teaches that it stores a measured fraction of the amplitude readback signal.);

Reading said test pattern to obtain an observed amplitude of a signal produced by said test signal (Col. 6, Lines 25-27);

Comparing said measured amplitude to said observed amplitude (Col. 2, Lines 46-50 and Col. 6, Lines 15-23. Alex teaches that after a certain period it re-reads the data in order to verify (i. e. compare) if the data needs to be refreshed.);

And producing a thermal decay-warning signal if said comparison is unfavorable (Col. 2, Lines 49-55. Alex teaches that if the comparison falls below a certain threshold, it sends a signal to the controller indicating to switch indicating a thermal decay in order to refresh the signal. Therefore, such actions have been interpreted as a warning conditions or functions with an association of a warning signal for aborting the system to refresh the signal. See also Col. 5, Lines 7-67, wherein Alex defines its interpretation of thermal decay according to page 2, Line 11 to Page 3, Line 15 of the specification.).

Regarding Claims 36 and 47, Sacks et al. teach a hard disk drive, comprising:

A base (It is a well known element to the artisan in the art that a base is a part of a drive structure (i.e. chassis).);

A magnetic storage disk comprising a magnetic storage material and a plurality of data tracks (Fig. 7, Element 12);

A transducer head for reading and writing information to said data tracks, wherein said information comprises at least a first test pattern, and wherein said transducer head is movable in radial direction with respect to said disk to address a selected one of said plurality of data tracks (Fig. 7,

Element 43. It is obvious that a transducer moves radially throughout the disk.);

A voice coil motor, interconnected to said transducer head, for moving said transducer head with respect to said data tracks (Fig. 7, Element VCM);

A controller, interconnected to said voice coil motor, for controlling a position of said transducer head with respect to said data tracks (Fig. 7, Element 11 and Col. 6, Lines 46-65. The micro-controller is interconnected with the Digital Signal Processor, which is connected to the Positioning driver, which controls the position of the transducer throughout its movement.)

A channel interconnected to said transducer head, wherein an amplitude of a signal derived from said at least a first test pattern encoded in said at least a first of said plurality of data tracks and read from said at least a first of said plurality of data track is transmitted by said channel (Col. 3, Lines 5-10), and wherein a thermal decay warning signal is generated if said amplitude of said signal derived from said at least a first test pattern is less than a reference amplitude (Col. 2, Lines 49-55. Alex teaches that if the comparison falls below a certain threshold, it sends a signal to the controller indicating to switch indicating an thermal decay in order to refresh the signal. Therefore, it would have been obvious to know that

some sort of signal must be sent to the apparatus to warn the occurrence of thermal decay.).

Regarding Claims 4, 14, 24, 26, 33, 37 and 48, Alex teaches all the limitations of Claims 1, 11, 21, 30, 36 and 47, respectively. Alex further teaches identifying a sector of said magnetic disk at which a magnetic medium comprising an information storing portion of said magnetic disk is thinner than an average magnetic medium thickness of said magnetic disk, wherein at least a portion of said test pattern is written to said identified sector (Col. 5, Lines 7-40. Alex teaches an embodiment of its invention wherein the change the bit spacing and according to Alex, if the bit spacing is changed, the film thickness obviously changed.).

Regarding Claims 6 and 16, Alex teaches all the limitations of Claims 1 and 11, respectively. Alex further teaches that in response to a thermal decay-warning signal, refreshing data stored on at least a portion of said magnetic disk (Col. 2, Lines 49-55. Alex teaches that if the comparison falls below a certain threshold, it sends a signal to the controller indicating to switch indicating an thermal decay in order to refresh the signal.).

Regarding Claims 7 and 17, Alex teaches all the limitations of Claims 1 and 11, respectively. Alex further teaches wherein a test pattern is written to each data storage surface of each magnetic disk included in a hard drive (Col. 2, Lines 42-43 and Col. 6, Line 1-7 and Col. 10, Lines 3-10. Alex teaches data tracks being written in the medium and being analyzed by a test circuit, therefore, the tracks being used are tested and

considered a test track with a particular test pattern being analyzed by the circuit. Alex teaches in an invention one disk wherein it records at least one test pattern.).

Regarding Claims 8 and 18, Alex teaches all the limitations of Claims 1 and 11, respectively. Alex further teaches wherein said steps of reading said test pattern to obtain an observed amplitude of said test signal, comparing said measured amplitude to said observed amplitude, and producing a thermal decay warning signal if said comparison is unfavorable are performed periodically (Col. 2, Line 66 to Col. 3, Line10).

Regarding Claims 9, 19, 32 and 40, Alex teaches all the limitations of Claims 1, 11, 30 and 36, respectively. Alex further teaches having a portion of a magnetic disk having a greater than average susceptibility to thermal decay is created during manufacture of said magnetic disk, and wherein said test pattern is written to said portion of said magnetic disk (Col. 2, Lines 10-15 and Col. 2, Lines 42-43 and Col. 6, Line 1-7 and Col. 10, Lines 3-10. Alex teaches data tracks being written in the medium and being analyzed by a test circuit, therefore, the tracks being used are tested and considered a test track with a particular test pattern being analyzed by the circuit. Alex teaches in an invention one disk wherein it records at least one test pattern.).

Regarding Claim 10 and 34, Alex teaches all the limitations of Claims 1 and 30, respectively. Alex further teaches that the data is written according to a longitudinal scheme (Col. 11, Lines 47-49).

Regarding Claims 20 and 35, Alex teaches all the limitations of Claims 11 and 30, respectively. Alex further teaches that the data is written according to a perpendicular scheme (Col. 11, Lines 47-49).

Regarding Claim 31, Alex teaches all the limitations of Claim 30. Alex teaches further comprising: Writing a first evaluation test pattern to said magnetic storage medium and writing a second evaluation test pattern to said magnetic storage medium, wherein said test pattern is selected from at least said first and second evaluation test patterns (Col. 2, Line 42 to Col. 3, Line 10).

Regarding Claims 2, 28, 43 and 52, Alex teaches all the limitations of Claims 1, 21, 36 and 47, respectively. Alex further teaches writing information to at least a first track of said magnetic disk at a first frequency, wherein said first frequency is higher than a nominal frequency (Col. 10, Lines 3-10).

Regarding Claim 38, Alex teach all the limitations of Claim 37. Alex fails to teach wherein said prescribed amount comprises a thickness that is less than about 90% of an average thickness of said magnetic storage material. One of ordinary skill in the art would have been motivated to have had less than about 90% since such ranges, absent any critically (i. e., unobvious and/or unexpected result(s)), are generally achievable through routine optimization/experimentation, and since discovering the optimum or workable ranges, where the general conditions of a claim are disclosed in the prior art, involves only routine skill in the art, *In re Aller*, 105 USPQ 233 (CCPA 1955). Moreover, in the absence of any critically (i. e., unobvious and/or unexpected result(s)), the parameters set forth would have been obvious to a person of ordinary skill in the art at the time the invention was made, *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Regarding Claim 39, Alex teach all the limitations of Claim 37. Alex further teach wherein said magnetic storage disk is formed having a magnetic storage material thickness that is intentionally reduced in said area of said magnetic storage disk having a magnetic storage material thick ness that is less than a prescribed amount (Col. 5, Lines 7-40. Alex teaches an embodiment of its invention wherein the change the bit spacing and according to Alex, if the bit spacing is changed, the film thickness obviously changed.).

Regarding Claim 49, Alex teaches all the limitations of Claim 48. Alex further teaches wherein said area of said magnetic storage disk comprising at lease a first of said data tracks and comprising said magnetic storage thickness is formed at a predetermined location on said magnetic storage disk. (Col. 5, Lines 7-40. Alex teaches an embodiment of its invention wherein the change the bit spacing and according to Alex, if the bit spacing is changed, the film thickness obviously changed It would have been obvious to an artisan in the art to know that if it performs an embodiment in a predetermined area of the disk.).

Regarding Claims 50 and 51, Alex teaches all the limitations of Claim 49. Alex further teaches wherein said hard disk drive stores data according to a longitudinal recording scheme, and wherein said predetermined location is towards an inside/outside diameter of the disk. (Col. 5, Lines 7-40. Alex teaches an embodiment of its invention wherein the change the bit spacing and according to Alex, if the bit spacing is changed, the film thickness obviously changed It would have been obvious to an

artisan in the art to know that if it performs an embodiment in a predetermined area of the disk.).

Claims 3, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alex as applied to claim 2 above, and further in view of Emo et al. (US Patent No. 6, 091, 559). Alex teaches all the limitations of Claims 2 and 36, respectively. Alex fails to teach wherein at least a first track located within a first zone, wherein said first frequency is a nominal frequency for a second zone, and wherein said first zone is located towards an inside diameter relative to said second zone. However, this feature is well known in the art as disclosed by Emo et al., wherein it teaches a disk divided in a plurality of zones, each zone with its own recording frequency (Pat. No. 6, 091, 559; Col. 18, Lines 20-41. Emo teaches that each zone has its own frequency in order to optimize head to disc performance when performing read/write operations.). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Alex invention in order to provide different frequencies in the zones in order to optimize head to disk performance (Col. 17, Lines 53 to Col. 18, Line 41).

Allowable Subject Matter

Claims 5, 12, 13, 22, 25, 26, 27, 29, 44, 45, 46 and 53 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. "A Fast, Accurate, and Reproducible In-Drive Measurement of Media Thermal Decay", by B. Higgins and B. Scardt, "Thermal Decay in High Density Disk Media", by Y. Zhang and H. Bertrand, "Experimental Study of Thermal Decay in High-Density Magnetic Recording Media", by Y. Hosoe et al. and "High Density Magnetic Recording Media Design and Identification: Susceptibility to Termal Decay", by P. Lu and S. Charap, wherein it discusses further about themal decay on magnetic discs and US Patent No. 6, 490, 111 to Sacks et al., and US Patent No. 6, 373, 647 to Baker.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glenda P. Rodriguez whose telephone number is (703)305-8411. The examiner can normally be reached on Monday thru Thursday: 7:00-5:00; alternate Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on (703)308-4825. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gpr
February 26, 2004.

DAVID HUDSPETH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600